

ABSTRACT OF THE DISCLOSURE

A new damage resistant and tolerant optical element is disclosed. Prior art solid or liquid host matrices are replaced by a soft crosslinked polymer or similar host material. The viscoelastic properties of the matrix host material are controlled during formation so that there are regions of different softness, of stiffness, within the matrix, to form a stiffness gradient. Preferably, the matrix will be softest at a preselected focal plane where maximum electromagnetic radiation or energy output may be expected. The host matrix is doped with an appropriate dopant having a concentration distribution, preferably such that the concentration of dopant is highest in the region where the host matrix material is most soft. Two important disclosed example embodiments are an optical limiter and a solid state dye laser.